U.S. Army Military Munitions Response Program Site Inspection

MILITARY MUNITIONS RESPONSE PROGRAM SITE INSPECTION

Deseret Chemical Depot

Utah

Restoration Advisory Board Meeting

15 November 2005

Welcome

- Meeting Purpose
    - To provide summarize information regarding the Military Munitions Response Program (MMRP)
    - To provide an update on Site Inspection (SI) activities completed at Deseret Chemical Depot (DCD)

Note: There are lists of definitions and acronyms at the end of this presentation for reference.

Overview of Military Munitions Response Program

- In 2001, the MMRP was created to specifically address human health, safety, and environmental concerns resulting from explosive hazards and munition constituent (MC) contamination at defense sites
- The MMRP is a new program element of the Defense Environmental Restoration Program (DERP)
- The MMRP typically follows CERCLA and the National Contingency Plan (may also be implemented under RCRA Corrective Action)
- The MMRP only applies to other than operational ranges where UXO, DMM, and MC is known or suspected and the release occurred prior to 30 Sep 2002

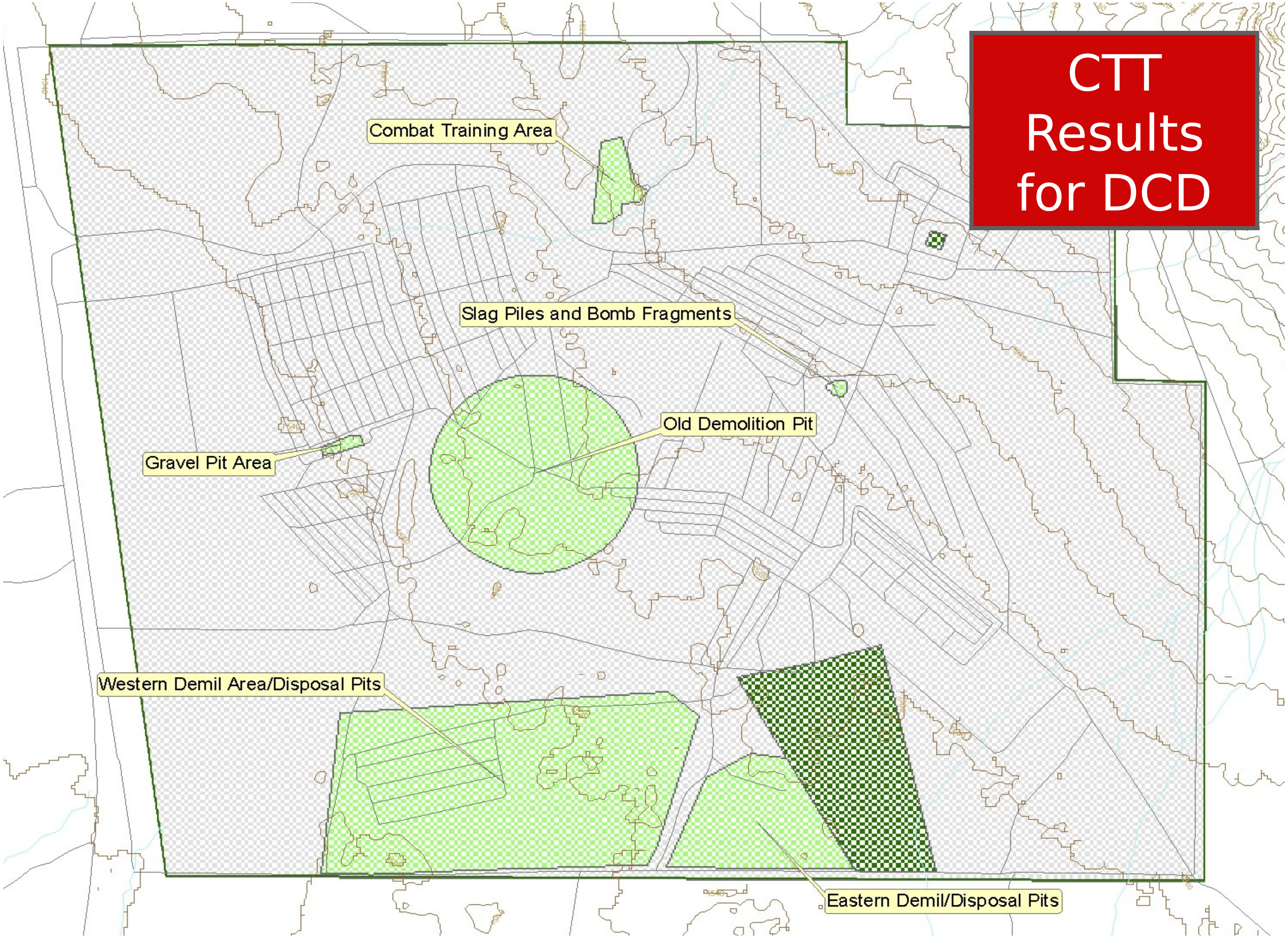
Overview of Military Munitions Response Program (concluded)

- The Phase 3 Army Range Inventory identified six MMRP sites at Deseret Chemical Depot (DCD)
  - Combat Assault Course
  - Old Demolition Pit
  - Gravel Pit Area
  - Eastern Demil/Disposal Pits
  - Western Demil Area/Disposal Pits
  - Slag Pile and Bomb Fragments

- The DCD Final Phase 3 Inventory Report is considered the PA

PA → SI → RI → FS → RD → RA → LTM

CTT Results for DCD


Combat Training Area
Slag Piles and Bomb Fragments
Old Demolition Pit
Gravel Pit Area
Western Demil Area/Disposal Pits
Eastern Demil/Disposal Pits

MMRP SI Implementation SI Project Team

- MMRP SI Program Management
  - United States Army Environmental Center (USAEC)
    - Mary Ellen Maly, Program Manager (410) 436-1511
- Executing Agent
  - United States Army Corps of Engineers (USACE) Sacramento District
    - Young Chong, Project Manager (916) 557-7212
- Contract Support
  - TechLaw, Inc.
    - Gene Barber, Project Manager (303) 763-7188
    - Mary Franquemont, Technical Team Leader
    - Larry Finan, TechLaw UXO Safety Specialist
    - Earth Tech – Subcontractor

MMRP SI Scope of Work
MMRP SI Goals

- Primary Goal - Collect the appropriate amount of data necessary to make a decision to determine which of the following actions are warranted at the site:
  - Remedial Investigation/Feasibility Study (RI/FS)
  - Interim Remedial Action/Removal Action
  - No Further Action Determination
- Secondary Goals
  - Complete Prioritization Protocol
  - Improve Cost to Complete Data

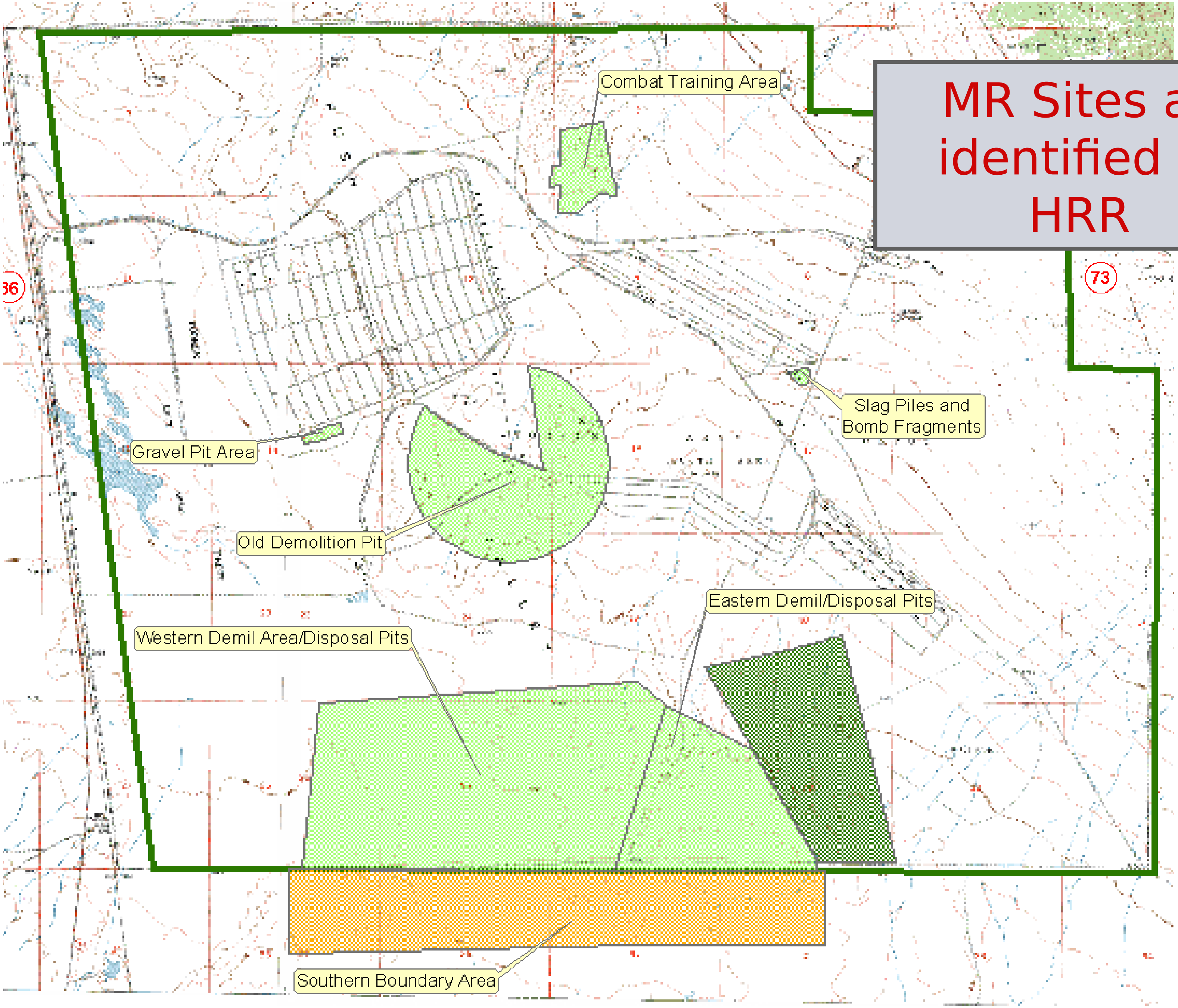
MMRP SI Implementation
MMRP SI Process - Overview

- USACE, Technical Project Planning definition and process
  - Stakeholder Identification and Involvement – 10 October 2004
  - Historic Records Search – 14 April 2005
  - MMRP Site Technical Project Planning
    - TPP 2 Meeting – 24 February 2005
    - Final Work Plan – 5 July 2005
  - Conduct MMRP SI and publish results
    - Field Work Activities – 11-18 July 2005
    - Draft SI Report – 23 September 2005
    - Final TPP Meeting – 18 October 2005
    - Final SI Report – 9 December 2005

Historical Records Review Summary

- Six MMRP sites were identified during the Phase 3 Range Inventory; one of these is a closed range and five are munitions sites
- One additional site was identified during the Historical Records Review (HRR); the Southern Boundary Area

MR Sites as identified in HRR

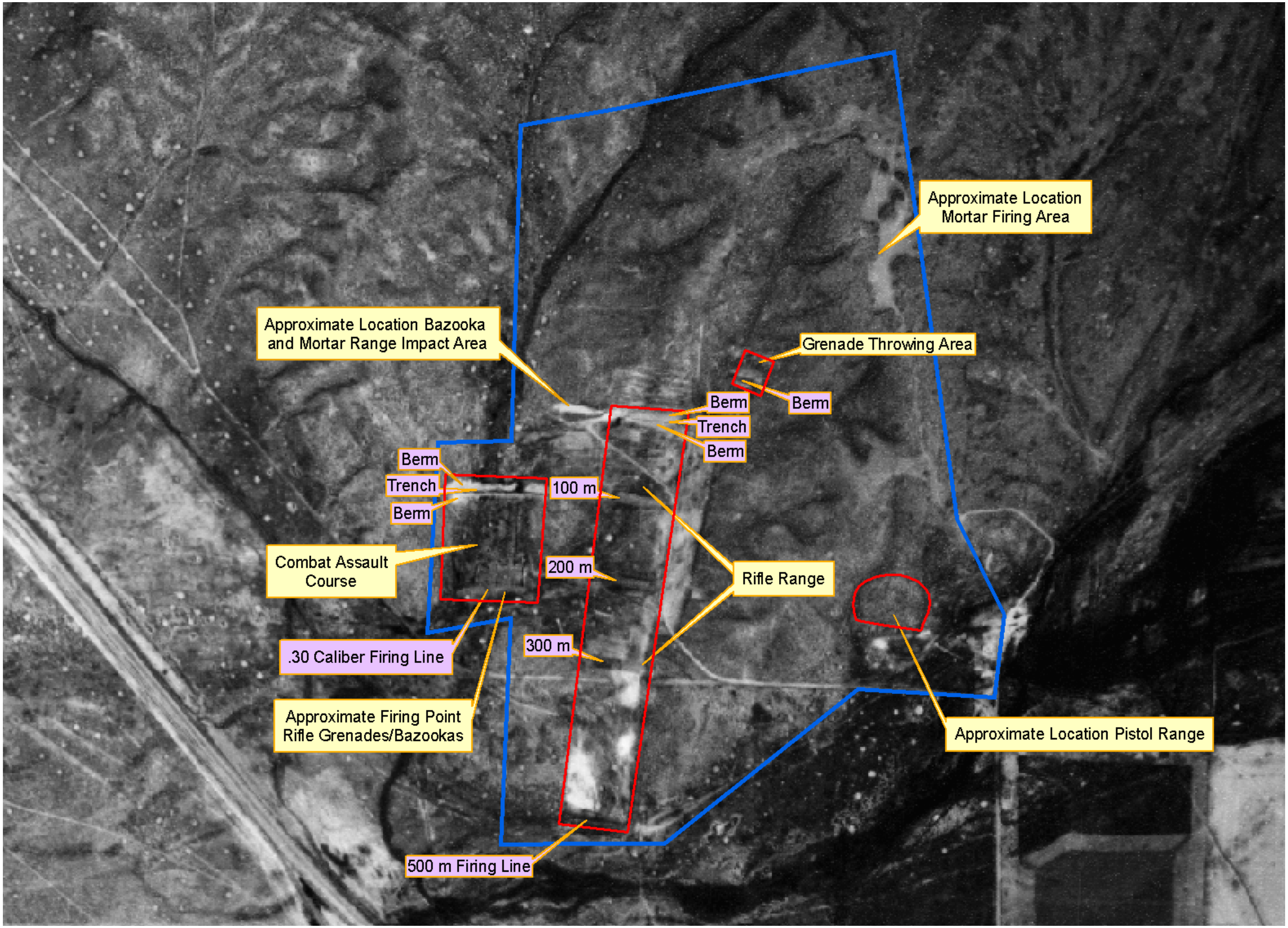

Combat Training Area
Slag Piles and Bomb Fragments
Gravel Pit Area
Old Demolition Pit
Eastern Demil/Disposal Pits
Western Demil Area/Disposal Pits
Southern Boundary Area
36
73

HRR Site Summaries

- Slag Piles and Bomb Fragments
  - Response Complete under the IRP
- Gravel Pit Area
  - 5.8 acres
  - No actions will be taken at this site until installation’s storage mission is complete
- Eastern Demil/Disposal Pits
  - Acreage modified from 308 to 472 acres
  - No actions under MMRP will be taken at this site until IRP activities are complete
- Western Demil Area/Disposal Pits
  - Acreage modified from 1,267 to 1,321 acres
  - No actions under MMRP will be taken at this site until IRP activities are complete

HRR Site Summaries
Combat Training Area

- Acreage modified from 59 acres in CTT Range Inventory to 94 acres
- Used as a training area from the early 1940s until approximately 1980
- Contained six sub-areas: Handgun Range, Combat Assault Course, Rifle Range, Hand Grenade Training Range, Bazooka Firing Range, and Mortar Training Range
- Previous investigations at the site included UXO removals in 1997 and 1999, and soil sampling 1997
- Lead was identified in the berm and trench in the target area on the Rifle Range

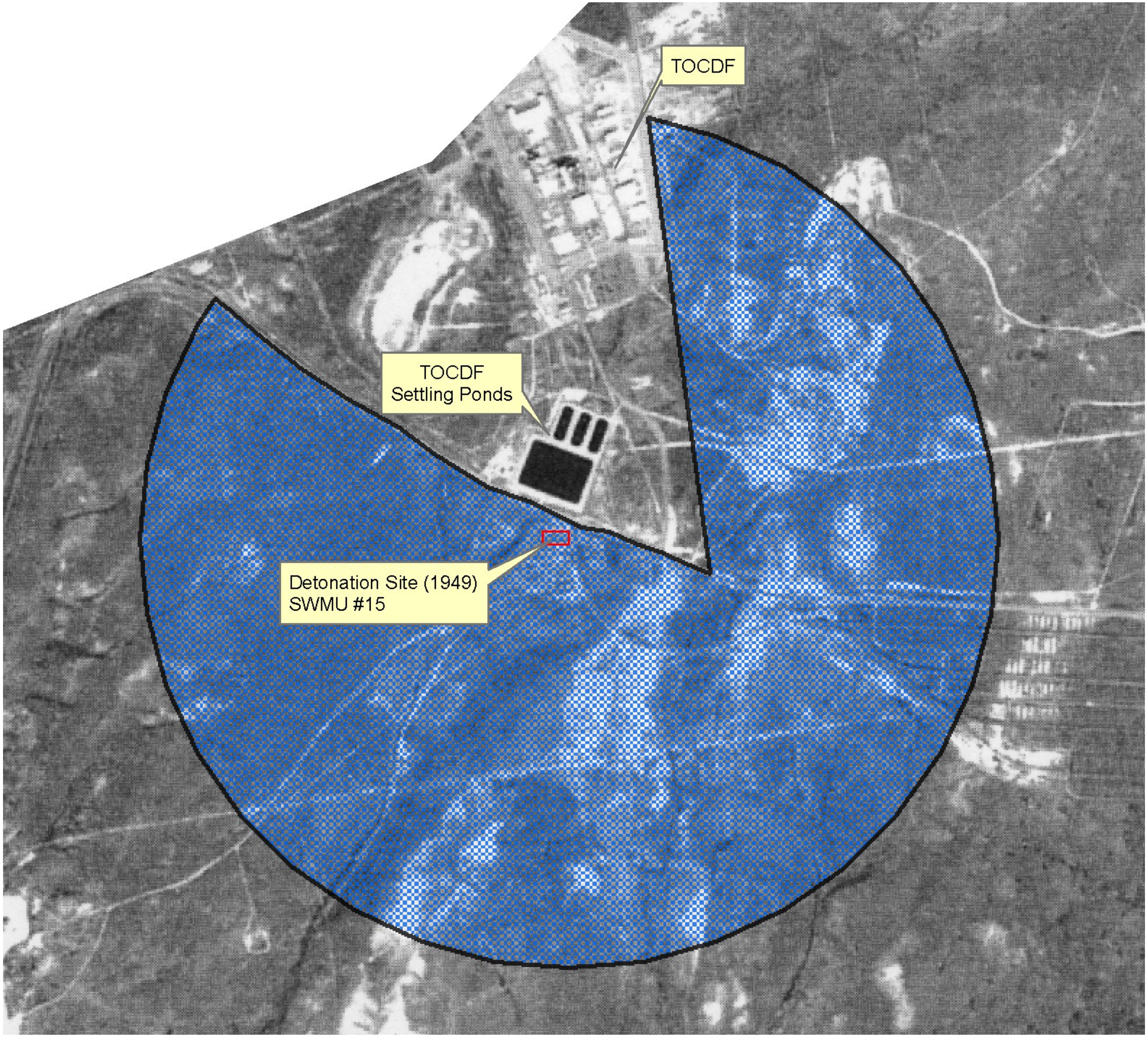

Approximate Location
Mortar Firing Area
Approximate Location Bazooka
and Mortar Range Impact Area
Grenade Throwing Area
Berm
Berm
Trench
Berm
Berm
Trench
Berm
100 m
200 m
300 m
Combat Assault
Course
Rifle Range
.30 Caliber Firing Line
Approximate Firing Point
Rifle Grenades/Bazookas
Approximate Location Pistol Range
500 m Firing Line

Aerial Photograph of Combat Training Area

HRR Site Summaries
Old Demolition Pit

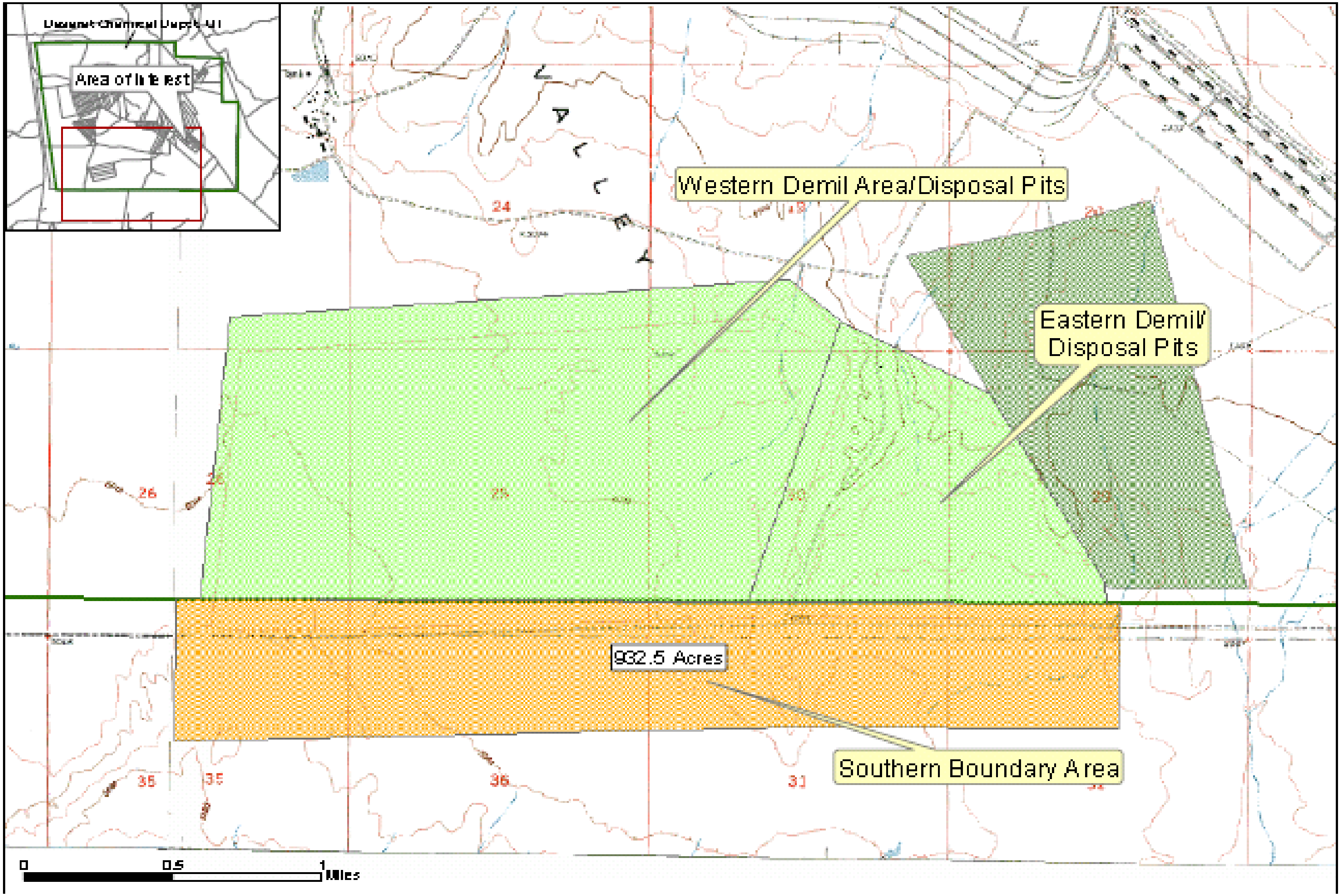
- Site was modified to exclude a northwestern portion of the original site, because area had previously been developed
- Acreage changed from 712 acres to 542 acres
- Accidental detonation of 4.2-inch high explosive shells occurred on the site in the late 1940s
- Location of detonation was identified as Solid Waste Management Unit (SWMU) 15 and was investigated during the RCRA Facility Investigation (RFI) in 1990
- SWMU 15 was determined to be Response Complete under the IRP

Aerial Photograph of Old Demolition Pit


TOCDF
TOCDF Settling Ponds
Detonation Site (1949) SWMU #15

HRR Site Summaries
Southern Boundary Area

- Site encompasses 932.5 acres located south of the south-central installation boundary
- UXO survey conducted under the IRP identified 10 UXO items in the area
- Site has been impacted by activities conducted in the Eastern Demil/Disposal Pits and the Western Demil Area/Disposal Pits
- No sampling for MC had been conducted at the site


Deseret Chemical Depot, UT
Area of Interest
VALLEY
Western Demil Area/Disposal Pits
Eastern Demil/ Disposal Pits
932.5 Acres
Southern Boundary Area
24
26
26
25
30
29
35
35
36
31
0
0.5
1
Miles

Southern Boundary Area Site Map

Deseret Chemical Depot SI Activities

- SI activities were conducted at DCD on 11-18 July 2005
- SI activities included
  - Soil Sampling
  - Visual Survey
    - Combat Training Area
    - Old Demolition Pit
  - Geophysical Survey
    - Combat Training Area

DCD SI Activities
FIELD INVESTIGATIONS

Purpose: To determine if MEC, munitions-related materials/debris, and/or munitions constituents are present at the site by the use of visual surveys, geophysical mapping, and surface soil sampling.

- Field work based on information from:
  - Initial TPP Meeting
  - Final HHR
  - Final Project Work Plan
- No intrusive investigations
- UXO Technician included on each team for safety

SI Activities – Visual Survey

Purpose: Identify potential surface MEC, munitions-related materials, and evidence of military activity

- Methodology
  - 10- to 15-foot wide transects
  - 100- to 150-foot intervals
  - Magnetometers and handheld electromagnetic (EM) metal detectors were used throughout the visual survey to aid in the identification of metallic items and to ensure the safety of the field teams
  - Global Positioning Satellite (GPS) System:
    - ➢Transect tracking (6-meter accuracy)
    - ➢Way-Point logged at munitions-related items
- Visual survey consisted of a total of 51 line miles of transects that were completed over two sites

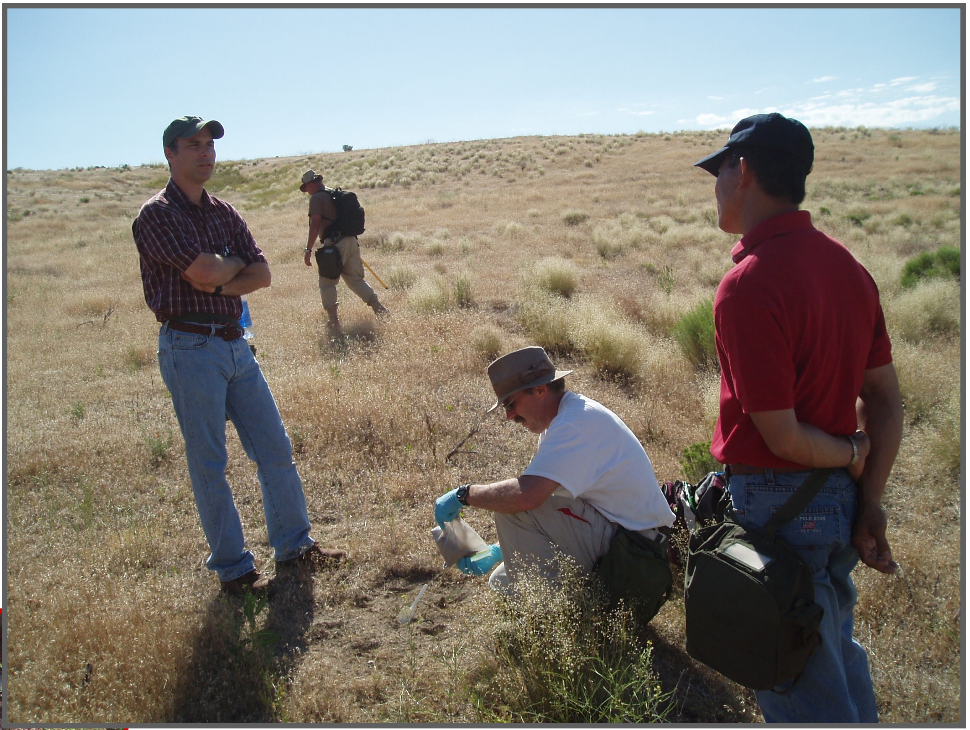
Visual Survey Equipment

SI Activities – Soil Sampling

Purpose: To determine if MC contamination is present near the surface at the sites

- Soil samples were collected from “Worst-Case Situation” locations where ordnance or scrap were identified and known areas of interest, such as berms and target areas
- A magnetometer was used to ensure that the sampling location was clear of anomalies
- Composite samples were collected from each location using a spoke and hub layout
- A total of 38 field soil samples were collected at the sites, along with 5 QA samples and 5 QC samples

Soil Sampling Protocol



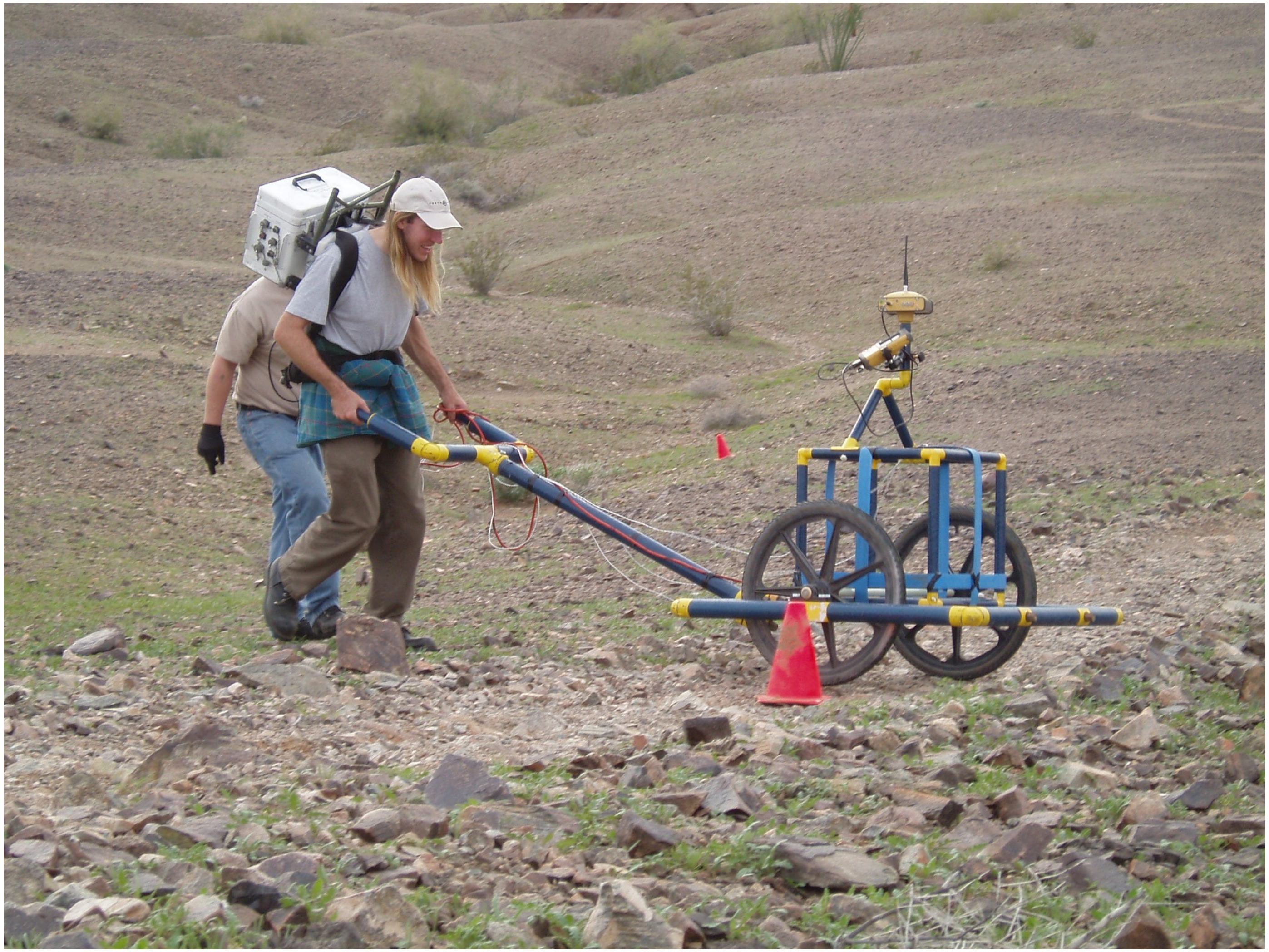
SI Activities – Soil Sampling (Continued)

- The samples were analyzed for:
  - Target Compound List (TCL) explosives – 16 explosives
    - Method 8330
  - Target Analyte List (TAL) metals – 23 metals
    - Method SW846 6010B
    - Method 7471A
- The results were then compared against the U.S. EPA Region 9 Preliminary Remediation Goals (PRGs) for residential soil
- Arsenic was also compared against background levels at DCD
- Arsenic concentrations in all samples exceeded the USEPA Region 9 PRG of 0.39 mg/kg; however, none of the results exceeded the background threshold level of 41 mg/kg

SI Activities – Geophysical Survey

Purpose: To determine the presence of subsurface anomalies within the Combat Training Area

- Methodology
  - Used Transient Electromagnetic (TEM) metal detector
  - Realtime Kinematic (RTK) GPS system
  - Instrument validation plot



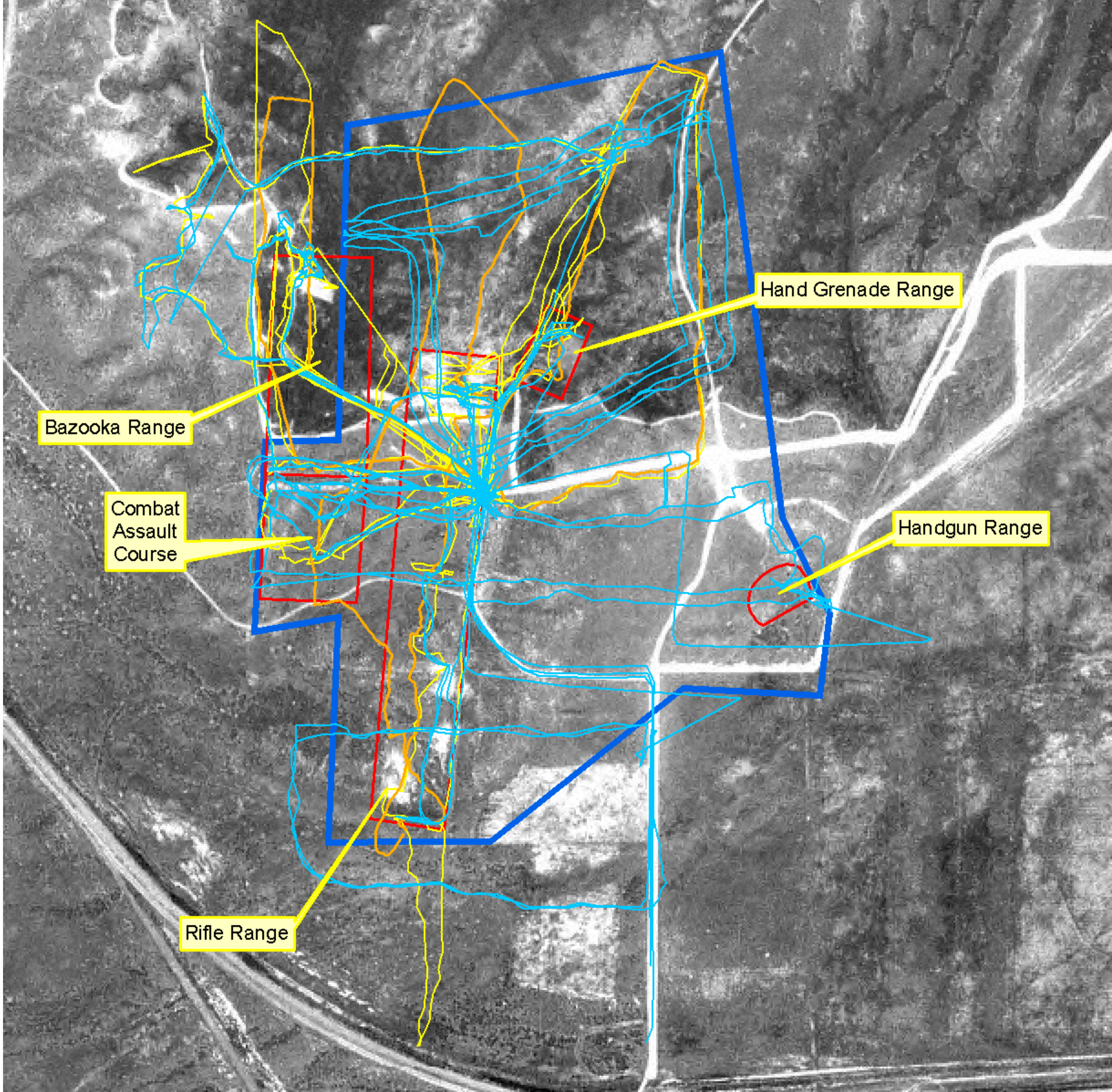
Geophysical equipment used at DCD

(Note: This photo was not taken at DCD, it's only purpose is to show the equipment used

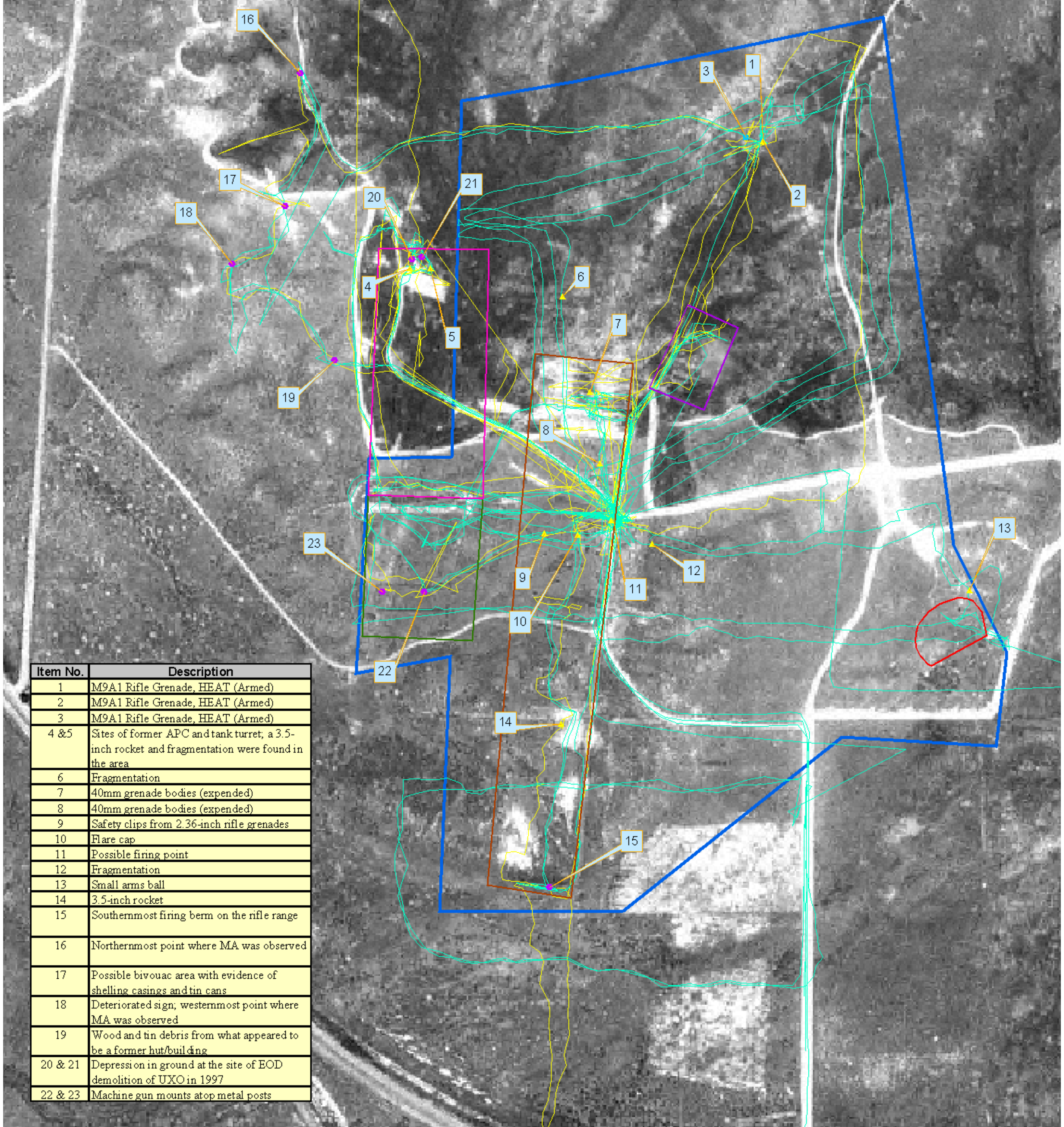
Combat Training Area SI Activities Visual Survey

- Approximately 39 line miles of visual surveys were conducted
- The visual survey resulted in the following findings:
  - Three M9A1 Rifle Grenades, HEAT (armed) were located on the ridge north of the Hand Grenade Range
  - EOD assistance was requested for removal of the items
  - Numerous munitions-related items were identified including 3.5-inch rockets, 40mm grenade bodies, grenade fuzes, and shell casings and projectiles from 7.62mm and 5.56mm small arms
  - The locations of sub-areas were better defined, especially the Bazooka Firing Range
  - No evidence of mortar firing was found during the visual survey

Visual Survey & Geophysical Transects


Hand Grenade Range
Bazooka Range
Combat Assault Course
Handgun Range
Rifle Range

Visual Survey Finds

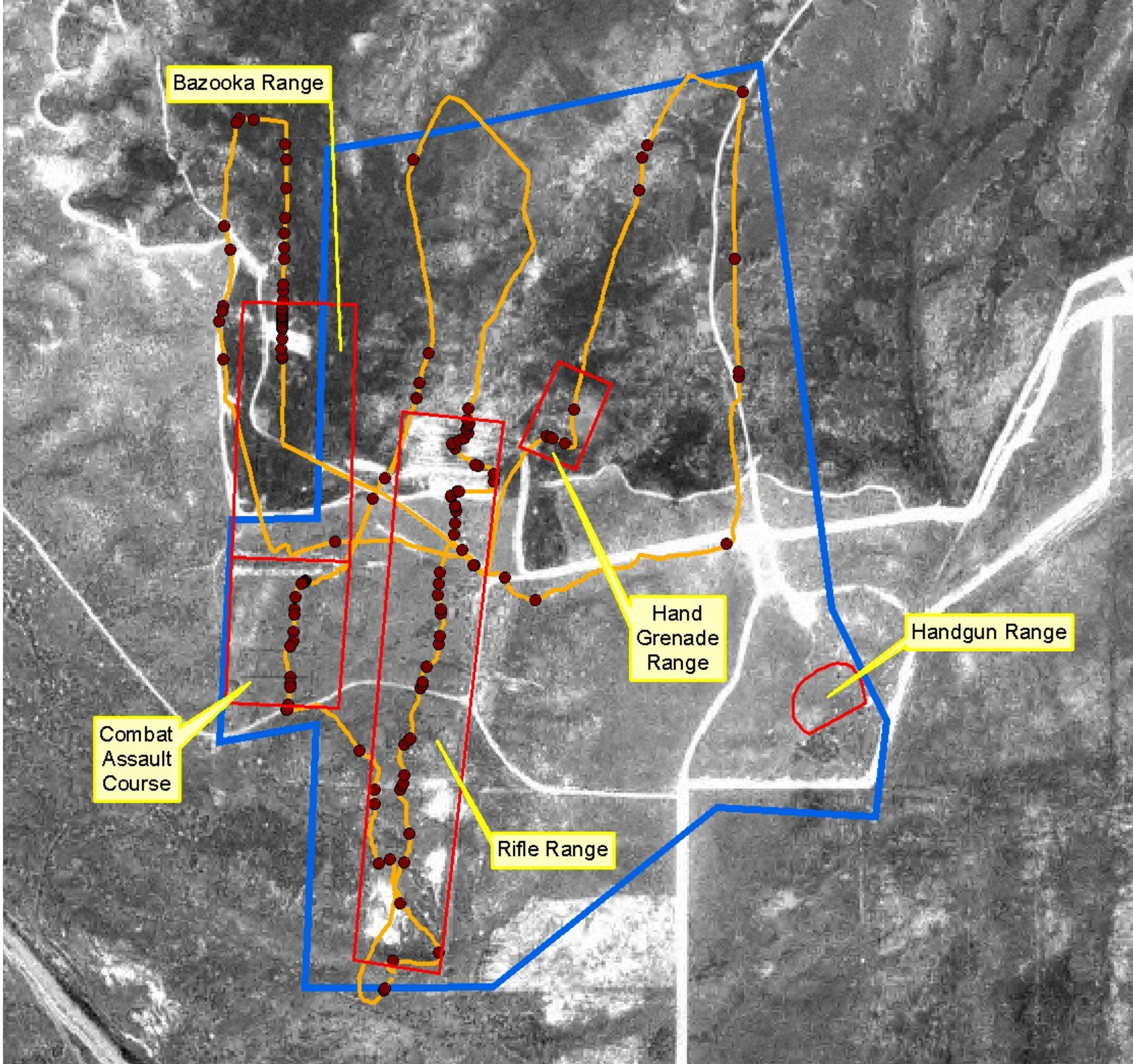


Item No.	Description
1	M9A1 Rifle Grenade, HEAT (Armed)
2	M9A1 Rifle Grenade, HEAT (Armed)
3	M9A1 Rifle Grenade, HEAT (Armed)
4 &5	Sites of former APC and tank turret; a 3.5-inch rocket and fragmentation were found in the area
6	Fragmentation
7	40mm grenade bodies (expended)
8	40mm grenade bodies (expended)
9	Safety clips from 2.36-inch rifle grenades
10	Flare cap
11	Possible firing point
12	Fragmentation
13	Small arms ball
14	3.5-inch rocket
15	Southernmost firing berm on the rifle range
16	Northernmost point where MA was observed
17	Possible bivouac area with evidence of shelling casings and tin cans
18	Deteriorated sign; westernmost point where MA was observed
19	Wood and tin debris from what appeared to be a former hut/building
20 & 21	Depression in ground at the site of EOD demolition of UXO in 1997
22 & 23	Machine gun mounts atop metal posts

Combat Training Area Geophysical Results

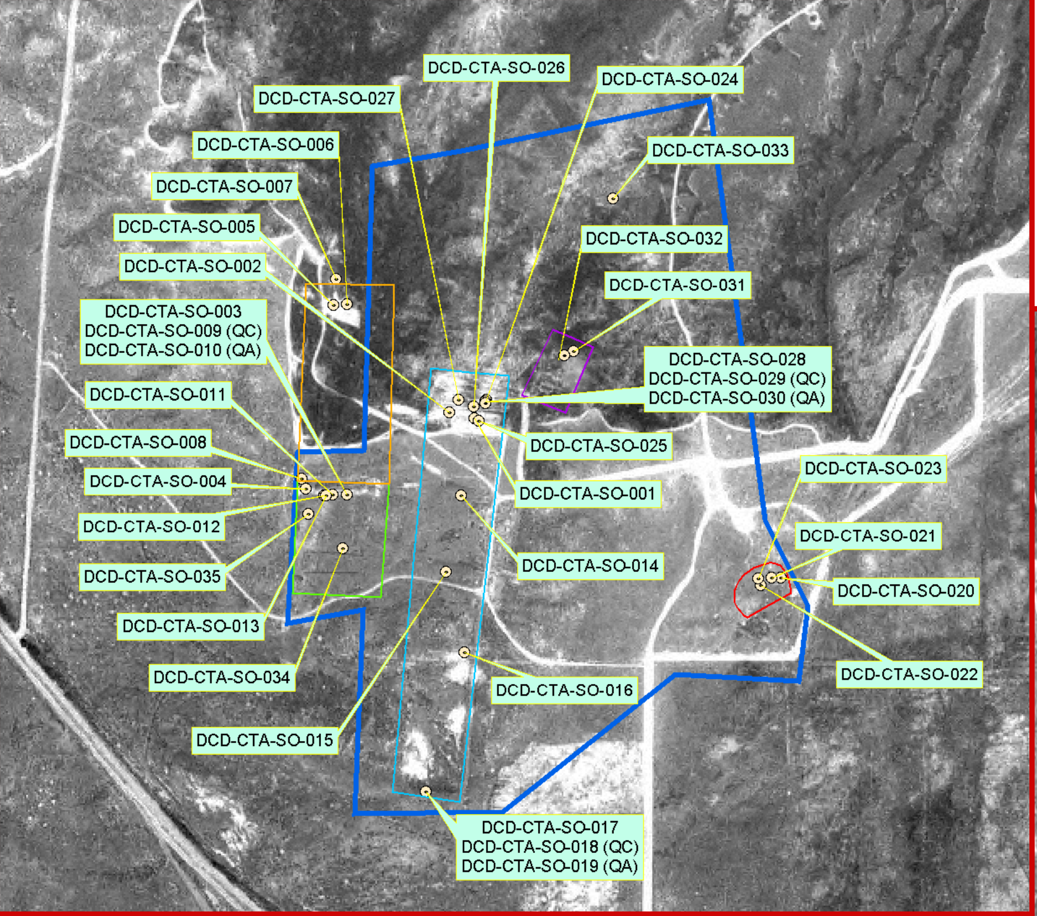
- Approximately 3.25 line miles of geophysical transects were completed
  - 6 transects in northern portion of CTA
  - 2 transects in southern portion of CTA
- Approximately 140 anomalies were identified with highest concentrations in the following areas:
  - Grenade throwing pits and target area
  - Rifle Range target berm and each berm used for firing
  - Combat Assault Course
  - Bazooka Firing Range target area

Geophysical Anomalies


Bazooka Range
Hand Grenade Range
Handgun Range
Combat Assault Course
Rifle Range

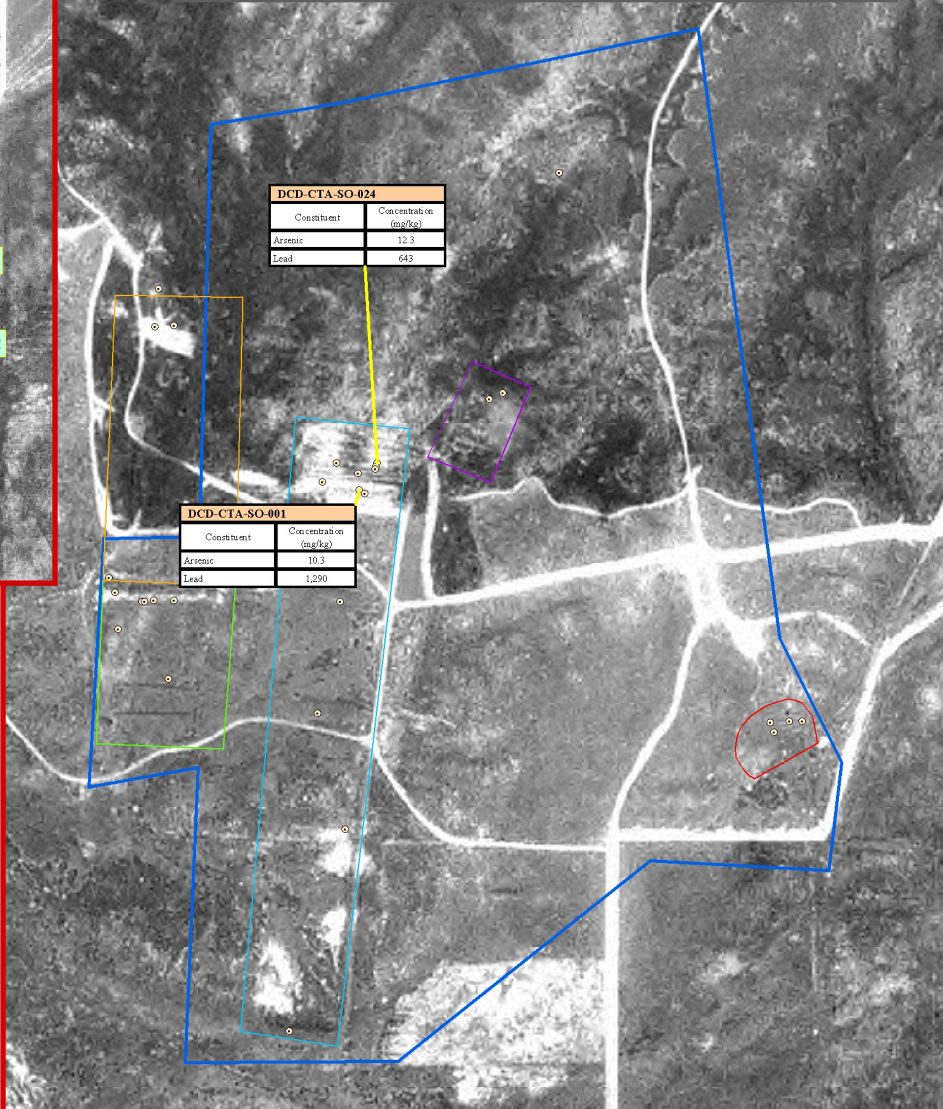
Combat Training Area Soil Sampling Results

- 35 surface soil samples were collected
- Lead was detected in exceedance of the USEPA Region 9 PRG in two samples collected in the target berm and trench at the Rifle Range
- Lead was detected slightly below the PRG in two samples collected from the target berm at the Handgun Range
- Trace amounts of explosives were detected in five samples collected throughout the site, but none exceeded the corresponding PRG


DCD-CTA-SO-026
DCD-CTA-SO-024
DCD-CTA-SO-027
DCD-CTA-SO-006
DCD-CTA-SO-033
DCD-CTA-SO-007
DCD-CTA-SO-005
DCD-CTA-SO-032
DCD-CTA-SO-002
DCD-CTA-SO-031
DCD-CTA-SO-003
DCD-CTA-SO-009 (QC)
DCD-CTA-SO-010 (QA)
DCD-CTA-SO-028
DCD-CTA-SO-029 (QC)
DCD-CTA-SO-030 (QA)
DCD-CTA-SO-011
DCD-CTA-SO-008
DCD-CTA-SO-025
DCD-CTA-SO-023
DCD-CTA-SO-004
DCD-CTA-SO-001
DCD-CTA-SO-012
DCD-CTA-SO-021
DCD-CTA-SO-014
DCD-CTA-SO-035
DCD-CTA-SO-020
DCD-CTA-SO-013
DCD-CTA-SO-022
DCD-CTA-SO-034
DCD-CTA-SO-016
DCD-CTA-SO-015
DCD-CTA-SO-017
DCD-CTA-SO-018 (QC)
DCD-CTA-SO-019 (QA)

Soil Sampling Locations

Soil Sample Exceedances



DCD-CTA-SO-024

Constituent	Concentration (mg/kg)
Arsenic	12.3
Lead	643

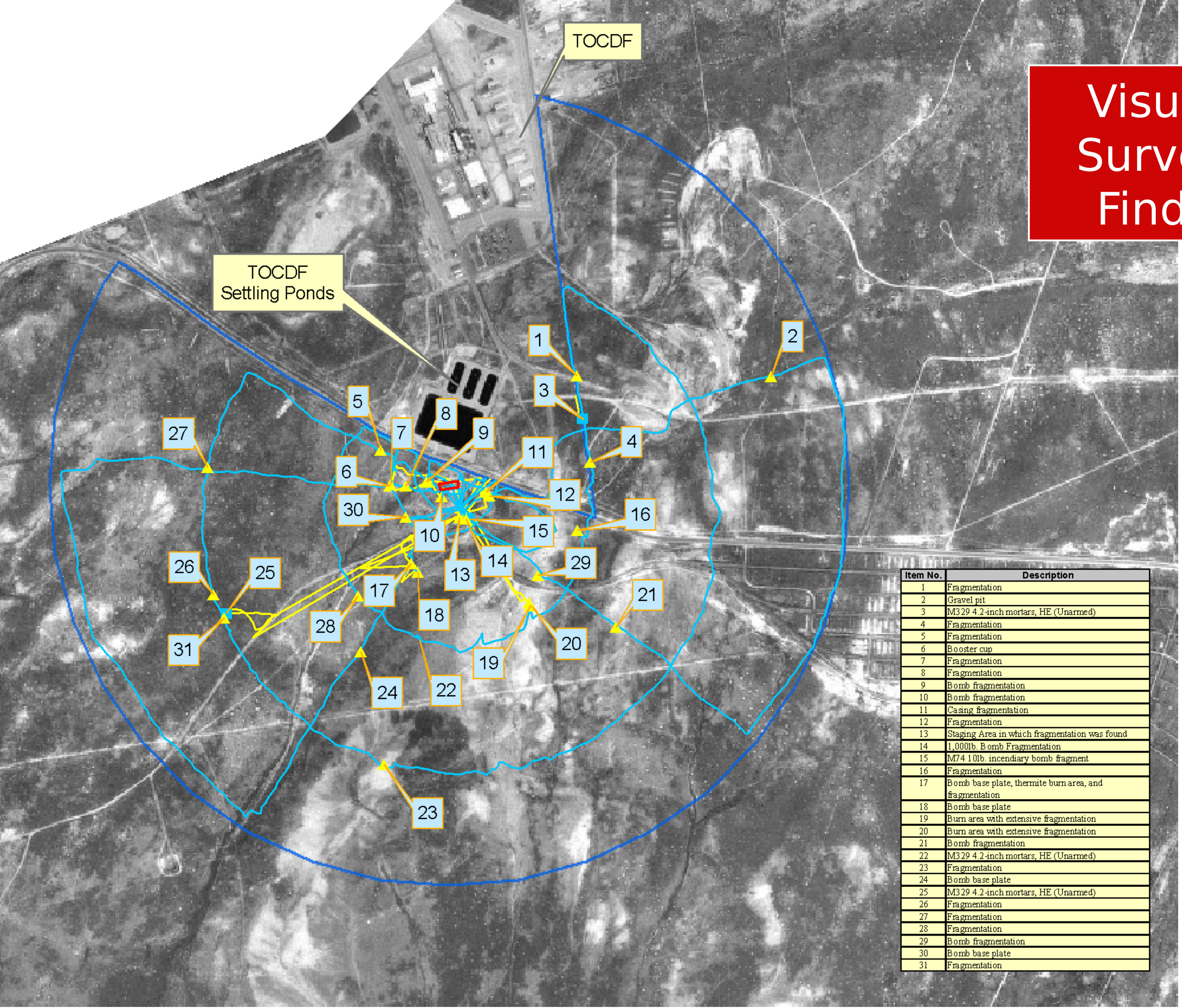
DCD-CTA-SO-001

Constituent	Concentration (mg/kg)
Arsenic	10.3
Lead	1,290

Old Demolition Pit
Visual Survey

- Approximately 11.5 line miles of visual surveys were conducted
- The visual survey resulted in the following findings:
  - Three M329 4.2-inch mortars and a M74 10lb. bomb fragment were identified throughout the site
  - EOD assistance was requested for removal of the items
  - Munitions debris was located throughout the site and included a booster cup, bomb fragmentation (1,000lb. bomb and chemical bomb, miscellaneous fragmentation, thermite, HE artillery shell fragmentation, slag piles, and numerous burn areas

Visual Survey Finds


TOCDF
TOCDF Settling Ponds
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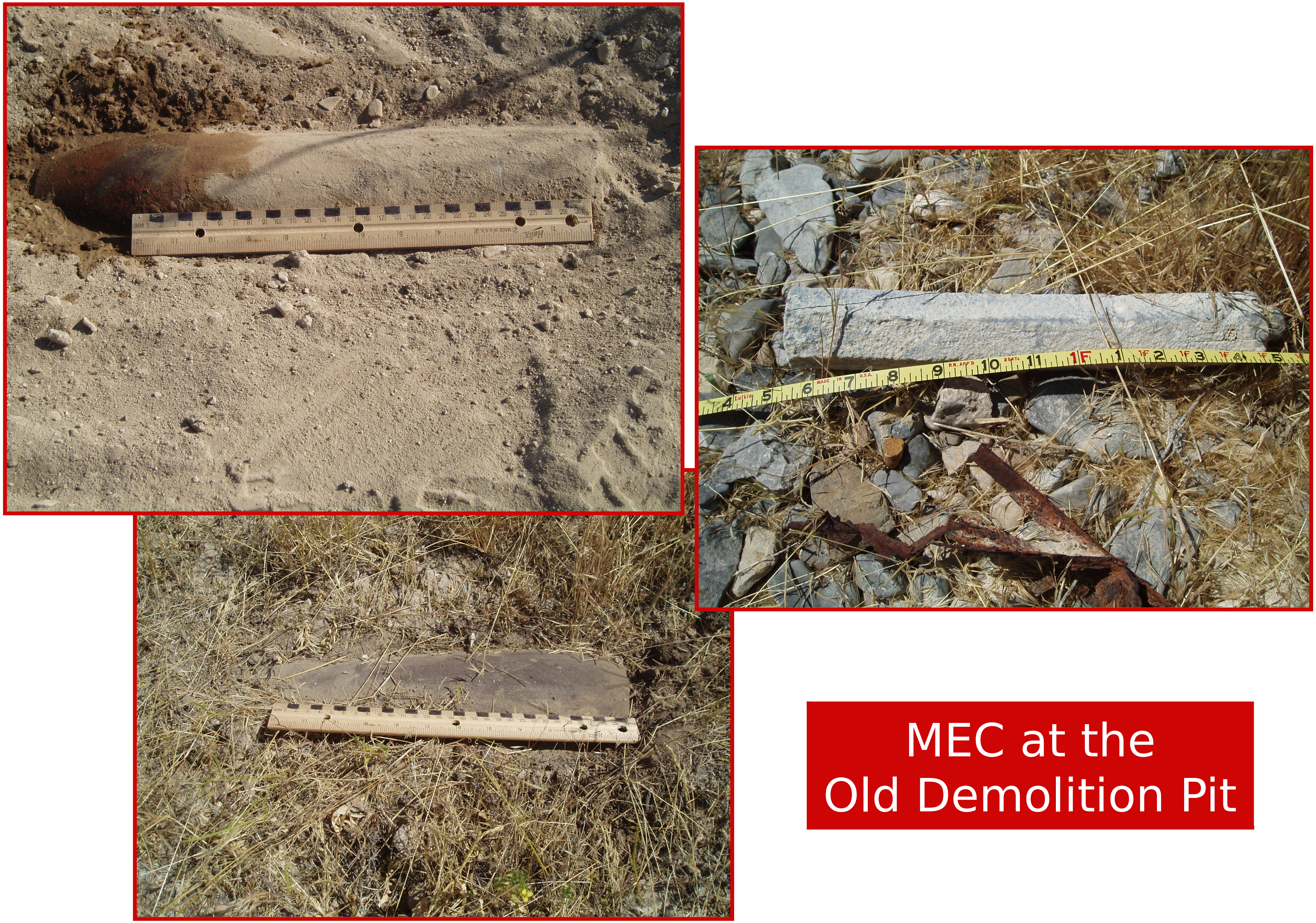
Item No.	Description
1	Fragmentation
2	Gravel pit
3	M329 4.2-inch mortars, HE (Unarmed)
4	Fragmentation
5	Fragmentation
6	Booster cup
7	Fragmentation
8	Fragmentation
9	Bomb fragmentation
10	Bomb fragmentation
11	Casing fragmentation
12	Fragmentation
13	Staging Area in which fragmentation was found
14	1,000lb. Bomb Fragmentation
15	M74 10lb. incendiary bomb fragment
16	Fragmentation
17	Bomb base plate, thermite burn area, and fragmentation
18	Bomb base plate
19	Burn area with extensive fragmentation
20	Burn area with extensive fragmentation
21	Bomb fragmentation
22	M329 4.2-inch mortars, HE (Unarmed)
23	Fragmentation
24	Bomb base plate
25	M329 4.2-inch mortars, HE (Unarmed)
26	Fragmentation
27	Fragmentation
28	Fragmentation
29	Bomb fragmentation
30	Bomb base plate
31	Fragmentation



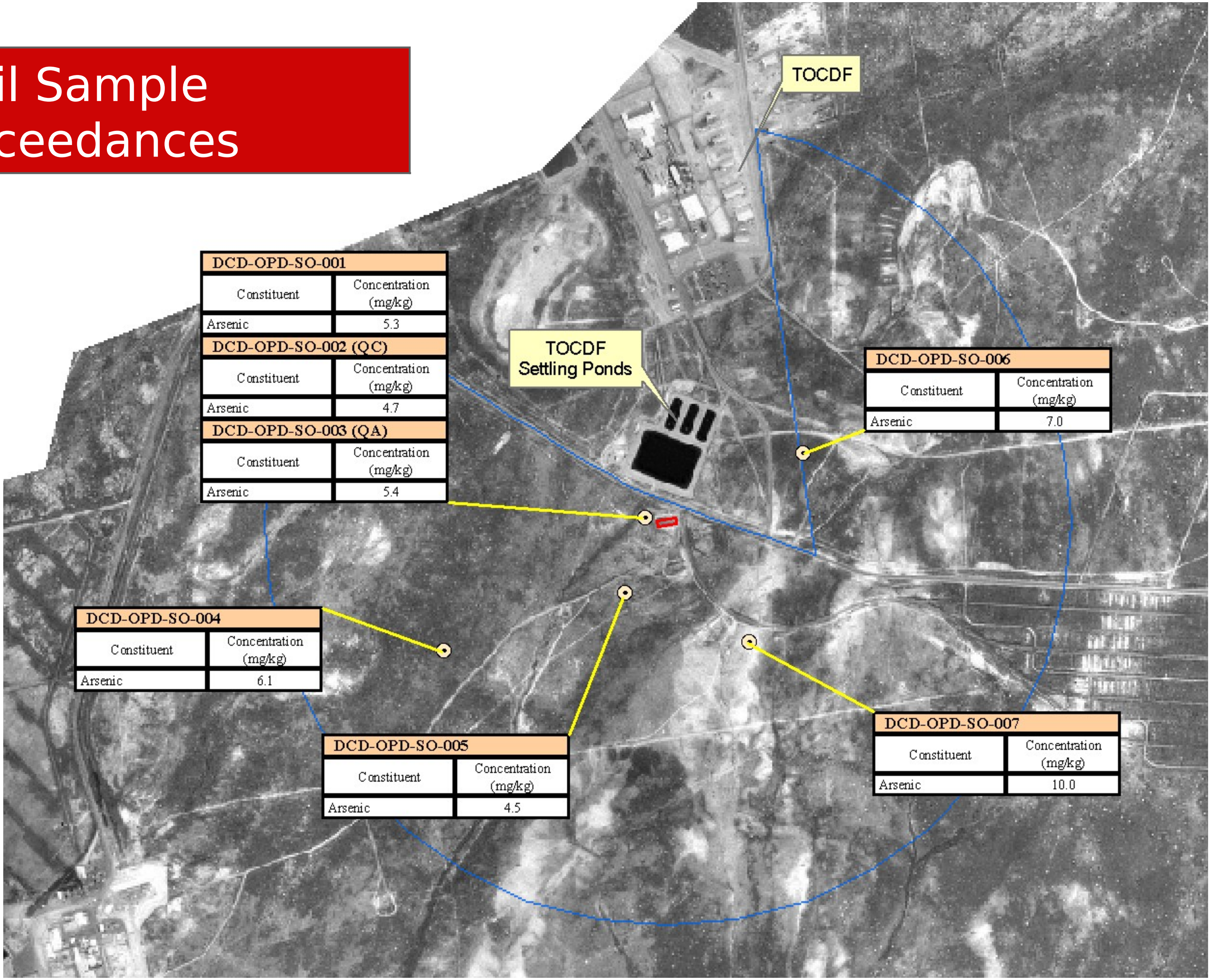
MEC at the Old Demolition Pit

Munitions Debris at the Old Demolition Pit

Old Demolition Pit
Soil Sampling

- 7 surface soil samples were collected
- Trace amounts of explosives were detected in three samples, but none e
  the corresponding PRG
- No exceedances of metals other than arsenic were detected

Soil Sample Exceedances



DCD-OPD-SO-001

Constituent	Concentration (mg/kg)
Arsenic	5.3

DCD-OPD-SO-002 (QC)

Constituent	Concentration (mg/kg)
Arsenic	4.7

DCD-OPD-SO-003 (QA)

Constituent	Concentration (mg/kg)
Arsenic	5.4

DCD-OPD-SO-004

Constituent	Concentration (mg/kg)
Arsenic	6.1

DCD-OPD-SO-005

Constituent	Concentration (mg/kg)
Arsenic	4.5

DCD-OPD-SO-006

Constituent	Concentration (mg/kg)
Arsenic	7.0

DCD-OPD-SO-007

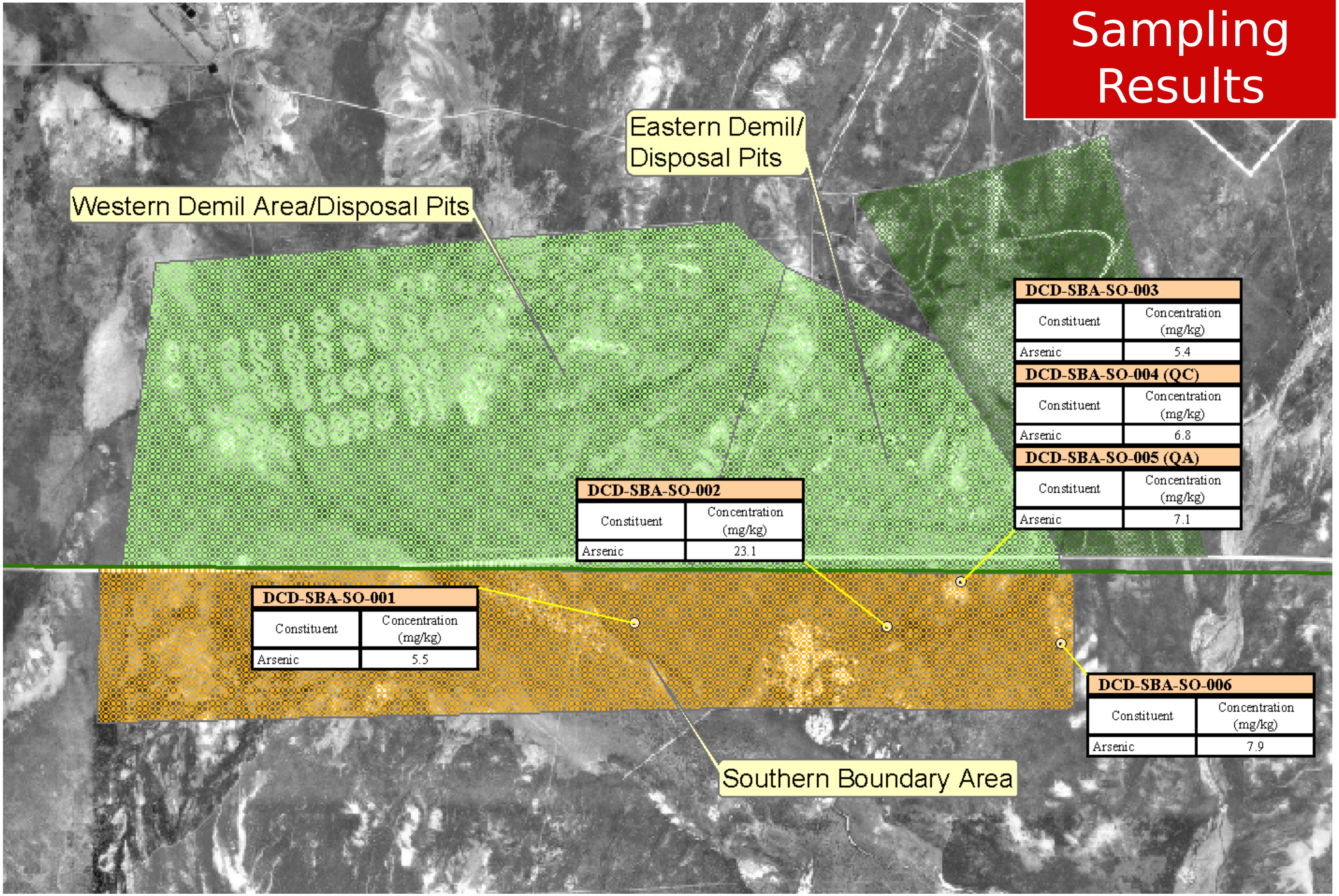
Constituent	Concentration (mg/kg)
Arsenic	10.0

Southern Boundary Area Soil Sampling Results

- 6 surface soil samples were collected
- Trace amounts of explosives were detected in one sampl but it did not exceeded the correspondin PRG

- No exceedances of metals other than arsenic were detected

Soil Sampling Results


Western Demil Area/Disposal Pits
Eastern Demil/ Disposal Pits
Southern Boundary Area

DCD-SBA-SO-001

Constituent	Concentration (mg/kg)
Arsenic	5.5

DCD-SBA-SO-002

Constituent	Concentration (mg/kg)
Arsenic	23.1

DCD-SBA-SO-003

Constituent	Concentration (mg/kg)
Arsenic	5.4

DCD-SBA-SO-004 (QC)

Constituent	Concentration (mg/kg)
Arsenic	6.8

DCD-SBA-SO-005 (QA)

Constituent	Concentration (mg/kg)
Arsenic	7.1

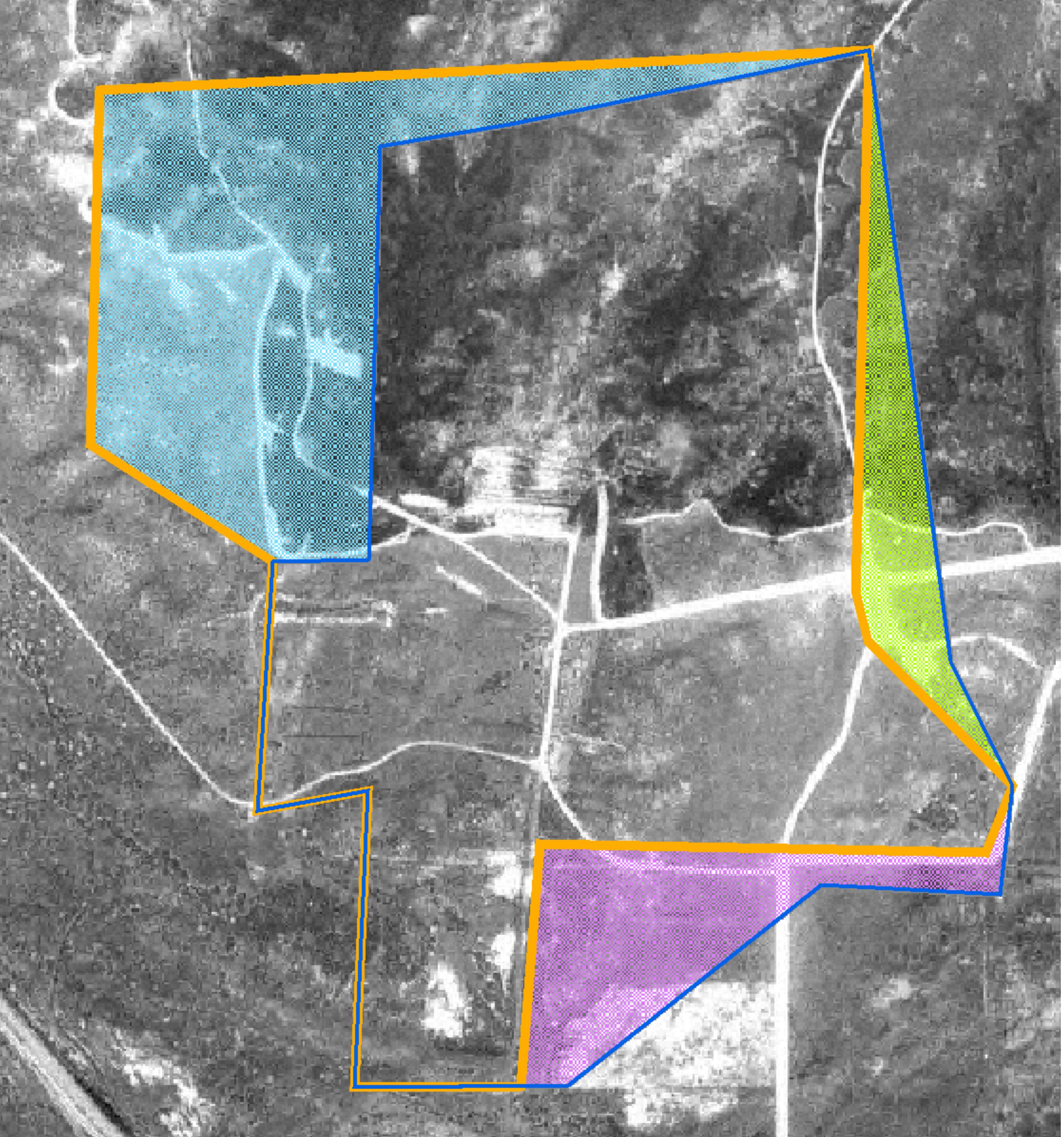
DCD-SBA-SO-006

Constituent	Concentration (mg/kg)
Arsenic	7.9

Combat Training Area – Conclusions

- The activities at the Combat Training Area included a visual survey of approximately 39 line miles, a geophysical survey of approximately 3.25 line miles, and the collection of 35 surface soil samples
- As a result of the field activities the boundary of the Combat Training Area MR site has become better defined
    - Approximately 25 acres located along the northwestern boundary that was the former location of the Bazooka Firing Range target area has been added
    - Approximately 6 acres along the eastern boundary that was a possible location of the Mortar Training Range has been removed from the site, because it contained no evidence of military activity
    - Approximately 9 acres in the southeast corner of the site has been removed, because it contained no evidence of military activity

Site Boundary Modifications



Combat Training Area – Conclusions (continued)

- Three MEC items and numerous other munitions-related items were identified during the visual survey at the Combat Training Area. The three MEC items were investigated and destroyed by the 62nd EOD unit. The items were determined to be M9A1 Rifle Grenades, HEAT (Armed).
- Approximately 140 subsurface anomalies were identified during the geophysical survey at the site. The greatest concentrations of anomalies were clustered on the rifle range berm, in the former target area for the bazooka range, and in the area of the combat assault course.
- Analytical results for metals indicate lead contamination exists in the target berm at the rifle range as concentrations from two samples exceed the USEPA Region 9 PRG of 400 mg/kg. All other concentrations of metals are below the screening criteria with the exception of arsenic, which appears to be naturally occurring at the site.

Combat Training Area – Conclusions (concluded)

- Analytical results for explosives indicate trace amounts in several samples; however, all results were below the screening criteria.
- Although only the berm at the rifle range reflected elevated levels of lead, all of the berms (rifle range, combat assault course, and handgun range) contained steel and lead fragments from small arms firing. Also, the rifle range berm reflected the use of 40mm grenades.

Old Demolition Pit - Conclusions

- The activities at the Old Demolition Pit included a visual survey of approximately 11.5 line miles and the collection of seven surface soil samples
- Four MEC items and numerous other munitions-related items were identified during the visual survey. The four MEC items were investigated and destroyed by the 62nd EOD unit. The items were determined to be three M329 4.2-inch mortars, HE (unarmed) and a M74 10lb. incendiary bomb fragment. The visual survey also revealed that the site had been used for the disposal of munitions as evidenced by numerous burn/slag piles, thermite burn areas, and munitions debris.
- Analytical results for explosives indicate trace amounts in several samples; however, all results are below the screening criteria.
- Analytical results for metals indicate that all sample concentrations are below the screening criteria with the exception of arsenic, which appears to be naturally occurring at the site.

Southern Boundary Area - Conclusions

- The only activity conducted in the Southern Boundary Area was the collection of six surface soil samples.

- Analytical results for explosives indicate a trace amount of 3-nitrotoulene in one sample; however, this result is below the screening criteria.

- Analytical results for metals indicate that all sample concentrations are below the screening criteria with the exception of arsenic, which appears to be naturally occurring at the site.

Deseret Chemical Depot Recommendations

- The analytical results for samples collected from all sites showed concentrations of arsenic that exceeded the screening criteria; however, these elevated levels appear to be naturally occurring due to arsenic-rich soils in the area. Therefore, it does not appear that arsenic needs to be further investigated at this time.

Combat Training Area

- Based on the results of the visual survey and geophysical survey which identified MEC and MC at the Combat Training Area, it is recommended that the site boundary be extended to include an additional 25 acres along the northwest boundary of the original MR site.
- Because no MEC or other evidence of military activity were observed in portions of the Combat Training Area MRS along the eastern border (approximately six acres) and the southeastern corner (approximately nine acres), it is recommended that these areas be removed from the MRS.

Recommendations (Continued)

Combat Training Area (continued)

- As a result of modifications to the Combat Training Area MRS boundary, it is recommended that the site be defined as encompassing 104 acres.
- Based on the identification of lead in concentrations exceeding the USEPA Region 9 PRG in the rifle range berm in the Combat Training Area, it is recommended that this area be further investigated for MC.
- Based on visual observations at the berms for the rifle range, combat assault course, and handgun range, it is recommended that these berms be sifted to remove lead fragments from small arms to preclude long-term exposure to lead. Additionally, it is recommended that the berm at the rifle range be further evaluated for 40mm grenades.

Recommendations (Continued)

Combat Training Area (concluded)

- Based on the results of the visual survey at the Combat Training Area that identified MEC and the geophysical survey that identified 140 anomalies, it is recommended that this MR site be further investigated for MEC. The area to be further investigated includes an additional 25 acres along the sites northwestern boundary, but does not include areas along the eastern and southeastern boundaries. The total acreage requiring further investigation encompasses 104 acres.

Recommendations (Continued)

Old Demolition Pit

- As a result of the visual survey at the Old Demolition Pit, new uses of the site as a munitions disposal and burn area were identified. Therefore, because these uses were extensive throughout the site, it is recommended that the MR site be further investigated for MEC.
- Based on the analytical results, it appears that MC does not need to be further evaluated at the Old Demolition Pit, at this time. However, if the further investigation of MEC at the site identifies significant areas of concern, additional sampling may be warranted.

Recommendations (Continued)

Southern Boundary Area

- Based on the analytical results of the surface soil samples collected in the Southern Boundary Area, it is recommended that no further action regarding MC be conducted at this site.
- Based on completion of the UXO survey to be conducted in the Southern Boundary Area under the IRP, additional recommendations regarding MEC may be required. Additionally, depending on the results, additional sampling for MC may also be warranted.

Recommendations (Concluded)

- As previously discussed in the HRR, three additional MR sites at DCD will require further investigation:
  - It is recommended that once DCD’s mission as a disposal facility for chemical materiel is completed, the Gravel Pit Area be further investigated for MEC and MC.
  - Portions of the Eastern Demil/Disposal Pits and the Western Demil Area/Disposal Pits MR sites are currently being addressed under the IRP. Once the IRP activities are complete and responsibility for the sites is transferred to the MMRP, further investigation and remediation of MEC and MC may be required.

Questions?

Definitions

- **CTT Range**
  - **Closed, Transferred and Transferring Range**
  - **Closed Range** – A Military Range that has been taken out of service as a range and that either has been put to new uses that are incompatible with range activities or is not considered by the military to be a potential range area. A closed range is still under the control of a DoD component. Closed ranges cannot occupy an area that has been identified as an active or inactive range. Closed ranges are those areas of land that used to be active/inactive ranges, are still owned by the Army, but are now used for non-range purposes.
  - **Transferred Range** – A Military Range that is no longer under military control and had been leased by DoD, transferred, or returned from DoD to another entity, including Federal entities. This includes a Military Range that is no longer under military control, but that was used under the terms of an executive order, special-use permit or authorization, right-of-way, public land order, or other instrument issued by the Federal land manager. Additionally, property that was previously used by the military as a range, but which did not have a formal use agreement, also qualifies as a transferred range.
  - **Transferring Range** - A Military Range that is proposed to be leased, transferred, or returned from the DoD to another entity, including Federal entities. This includes a Military Range that was used under the terms of a withdrawal, executive order, special-use permit or authorization, right of way, public land order, or other instrument issued by the Federal land manager or Property Owner. An active range will not be considered a “transferring range” until the transfer is imminent (generally defined as the transfer date is within 12 months and a receiving entity has been identified).

Definitions

- Defense Site
  - Locations that are or were owned by, lease to, or otherwise possessed or used by DoD
  - Does not include operational ranges; operating storage or manufacturing facilities; or facilities that are used for or were permitted for the treatment or disposal of military munitions.
- Discarded Military Munitions (DMM)
  - Munitions that have been improperly abandoned or disposed – generally buried
- Munitions Constituents (MC)
  - Any material s that originate from UXO, discarded military munitions, or other military munitions, including explosive and non-explosive materials, and emission, degradation, or breakdown elements of such ordnance or munitions
- Munitions and Explosives of Concern (MEC)
  - Munitions that may pose unique safety risks, including UXO, DMM, and MC present in high enough concentrations to pose an explosive hazard.

Definitions

- **Military Munitions (MM)**
  - Ammunition products and components
- **Military Munitions Response (MMR)**
  - Response to actions to address UXO, DMM, and MC
- **Military Range**
  - A designated land or water area set aside, managed, and used to conduct research on, develop, test and evaluate military munitions and explosives, other ordnance, or weapon systems, or to train military personnel in their use and handling. Ranges include firing lines and positions, maneuver areas, firing lanes, test pads, detonation pads, impact areas, and buffer zones with restricted access and exclusionary areas.
- **Operational Range**
  - Military range that is still in service and is being used for range activities, or a military range that is not currently used but is still considered by the military to be a potential range area, and that has not been put to a new use.
- **Unexploded Ordnance (UXO)**
  - Ordnance that was used, but did not function properly and remains unexploded

Acronyms

AEC	Army Environmental Center
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CSM	Conceptual Site Model
CTT	Closed, Transferring, and Transferred
DCD	Deseret Chemical Depot
DMM	Discarded Military Munitions
DoD	Department of Defense
GIS	Geographic Information System
IRP	Installation Restoration Program
MC	Munitions Constituents
MEC	Munitions and Explosives of Concern
MM	Military Munitions
MMRP	Military Munitions Response Program
PA	Preliminary Assessment
RAB	Restoration Advisory Board
RI/FS	Remedial Investigation/Feasibility Study
SI	Site Inspection
TPP	Technical Project Planning
USACE	U.S. Army Corps of Engineers
UXO	Unexploded Ordnance